Antiviral Therapy in Abnormally Susceptible Patients

A recent report, as well as our own experience with varicella in a child with leukemia, indicates an area of therapy that, at the moment, seems promising. In the past two years the clinical application of cytosine arabinoside in the treatment of varicella infections in children also suffering from leukemia, has been rewarded with considerable success. The recommended dose is 100 mg per square meter daily intravenously by rapid syringe injection. This was continued for seven days. Usually within 48-72 hours after starting therapy the old lesions dry up and no new crops are seen.

The occurrence of herpes simplex in prematures or newborn also requires rapid and intensive therapy. Moreover, the chronically ill child on immunosuppressive therapy with kidney, lung, or connective tissue disease, as well as those with hereditary or congenital defects in their immunity apparatus, are ready prey for infections, and viral infections, in these groups of highly susceptible children, are particularly devastating. Iododeoxyuridine, initially used in herpesvirus keratoconjunctivitis with considerable success, has been used in neonatal disseminated infections with some measure of success. Reports of its use in adults with herpesvirus hominis meningitis have also indicated variable results.

The use of an interferon inducer (polyinosinic-polycytidylic ribonucleic acid) in an infant with herpesvirus encephalitis was associated with rapid clinical improvement.

The development of severe virus infections in abnormally susceptible children should be rapidly evaluated and, if at all possible (weighing risk of disease against risk of treatment), treatment instituted.

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Measles Vaccine Updated

Inactivated, "killed" measles vaccine is no longer available having proved to be unreliable and to provoke late hypersensitivity responses. Attenuated vaccines are available which cause only moderate febrile reactions after about eight days. Gamma globulin may be given coincidentally with the vaccine which reduces these reactions but also decreases the degree of immunity and is recommended only in conjunction with that virus grown on dog kidney.

Children should be vaccinated any time after one year of age, avoiding those with immune deficiencies, malignant disease, acute infections, etc. This is not 100 percent effective, but equals that of most other immunizations. The risk of late encephalitis from the vaccine is probably nonexistent, and children are protected from the severe acute infection and the devastating encephalitis.

During 1970 there was an increase of reported measles. This might have been prevented by more general use of vaccine but may also be due to the periodicity of measles epidemics and more conscientious reporting than formerly.

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Synthesis of Human Growth Hormone

Dr. C. H. Li and his associates, who in 1956 first isolated and purified human pituitary growth hormone, and who in 1966 were able to determine its structure, announced in January 1971 that they had successfully synthesized the human growth hormone molecule. A complex peptide of a specific sequence of 188 amino acids with two disulfide bridges, it is the largest yet synthesized. The event is a major milestone in growth hormone research, although the amount produced was insufficient to adequately verify biologic activity. Among the possible investigative avenues opened by the discovery are those concerning the control of cellular growth, hormonal interrelationships in the regulation of metabolic processes and the control of lactation.

Of considerable interest is the possibility that human growth hormone may be synthesized in quantities sufficient for clinical use. To anticipate that this might be accomplished within the next decade is not unreasonably optimistic. On the other hand, a perhaps more realistic expectation is that the active "core" of human growth hormone will be found within the parent peptide and that this fragment may, in turn, be isolated in large quantities from the pituitaries of species other than man.

At present, some 20 percent of dwarfed children are found to have growth hormone deficiency and might benefit from human growth hormone administration. Such patients require approximately 1 mg per day of growth hormone obtained from cadaver pituitaries. However, the average adult human pituitary gland yields only 3 to 5 mg of the substance, and of the estimated 10,000 children with hypopituitarism, in this country alone, only about 6 percent are being so treated at this time.

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Important Advances in Phenylketonuria

The detection of phenylketonuria (PKU) by simple mass newborn screening methods discovered in the 1960's was a major breakthrough in the early diagnosis and treatment of metabolic biochemical genetic disorders. Most of the states in this country and many countries throughout the world now have mandatory screening. Early dietary treatment with careful monitoring of serum phenylalanine levels has proven effective in preventing mental retardation in affected children. A recent survey consisting of a questionnaire answered by 43 states revealed that 418 cases of PKU had been detected by newborn screening of 5.9 million infants, or an incidence of 1:14,100. (California's figures for the first four years of testing were 1:16,500.) Evidence from California and from the National Collaborative Study shows that over 80 to 86 percent of those detected by newborn screening are on the low phenylalanine diet by 30 days of age. The intelligence quotient of these early-treated infants with PKU is usually in the normal range (85 to 100). The results of this experience have been documented and discussed in a growing literature on this condition.

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Phototherapy for the Jaundiced Infant

Phototherapy is effective in the treatment or prevention of hyperbilirubinemia, as noted previously in this Section (Calif Med 112:60, 1970). The blue portion of the spectrum (420 to 460 nm) is most active in the photo-oxidation of bilirubin, and in some studies blue lights have been clinically more effective than white lights. This difference may be particularly important in Negro infants. The photodecomposition products of bilirubin have been shown, in the human, to be rapidly excreted in the bile. In consequence, there is more assurance than formerly that the lower serum bilirubin levels do in fact suggest that the risk of neurologic change is decreased.

While blue light is more effective, its use makes nursing care more difficult, since all infants appear severely cyanotic when placed under blue light. Nursing personnel must be skilled in the detection of cardiac or pulmonary distress by signs other than cyanosis. The choice of blue or white light should probably be individualized, depending on the type of nursery. Shielding of the eyes is mandatory for infants receiving phototherapy.

In one study, reduced stature and small head size were noted in a two-year follow-up of premature infants treated with phototherapy. Differences were small but statistically significant. However, neurologic development was normal in these infants, and, in still other studies, no effect on growth was observed. While no major toxicity has been demonstrated, the possibility of unrecognized toxic effects still exists. Phototherapy should